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93-ERB-194

Ms. Dru Butler, Program Manager
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State of Washington
Department of Ecology
P.O. Box 47600
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Mr. George C. Hofer
Hanford Project Manager
U.S. Environmental Protection Agency
1200 Sixth Avenue
Seattle, Washington 98101

Dear Ms. Butler and Mr. Hofer:

SUBMITTAL OF THE HEXONE STORAGE AND TREATMENT FACILITY CLOSURE PLAN NOTICE OF DEFICIENCY (NOD) RESPONSE TABLE, REVISION 0 (TS-2-2)

The NOD Response Table for the Hexone Storage and Treatment Facility Closure Plan is submitted by the U.S. Department of Energy, Richland Operations Office (RL), and the Westinghouse Hanford Company (WHC) for approval by the State of Washington Department of Ecology (Ecology). Submittal of this response table fulfills the July 19, 1993, commitment date. The NOD response table is in reply to Ecology's comments dated April 20, 1993.

Copies of this NOD response table will be distributed to representatives of your respective organizations as follows:

- D. Duncan, U.S. Environmental Protection Agency (2 copies)
- J. Wallace, Ecology (4 copies)
- T. Michelena, Ecology
- Ecology Library, Lacey Office

Should you have any questions regarding this transmittal, please contact Mr. R. G. Mcleod, RL, on (509) 372-0096 or Mr. F. A. Ruck III, WHC, on (509) 376-9876.

Sincerely,

James E. Rasmussen, Acting Program Manager
Office of Environmental Assurance,
Permits, and Policy
DOE Richland Operations Office

ERD:RGM

R. E. Lerch, Deputy Director
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Westinghouse Hanford Company

Enclosure

cc w/encl:
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S. Price, WHC
F. Ruck, WHC
D. Sherwood, EPA

No.	Comments/Response	Concurrence
1.	The level of detail in this closure plan is inadequate. The closure plan must contain enough detail to allow the evaluation of whether: A. The activities described in the plan satisfy the regulations, WAC 173-303-610(5) and 173-303-640(8). **RL/WHC Response #1: The regulations cited in this comment require that all contaminated equipment, structures, and soils be removed or decontaminated in accordance with WAC 173-303. It is the intent of this cleanup action to decontaminate and/or dispose of all contaminated equipment, structures, and soils at the Hexone Storage and Treatment Facility (HSTF), including disposal of all of the underground equipment and structures. This plan attempts to identify all such equipment and structures, and addresses compliant disposition of them. In some cases specifics are not given because insufficient information precludes this. The closure plan outlines the acquisition of this information [e.g., sampling and analysis (Chapter 7.0)], tank bed examination upon exposure, and waste designation of residues at the time of closure. Further detail will be provided and made available prior to and during closure as standard safety and operations documents are produced and closure actions reveal more information. If soil contamination exists and cannot be readily remediated during the tank removal operation, this soil cleanup will be coordinated with the CERCLA remedial action for the operable unit containing the HSTF, probably resulting in a significant delay. At the present time, this operation cannot be planned because consistent performance standards and operating procedures for CERCLA and RCRA cleanups are not available, and site planning**	

No.	Comments/Response	Concurrence

has not evolved sufficiently to allow pre-planning of this CERCLA action. It is envisioned that modifications to the closure plan will be made when deferral of soil cleanup would appear necessary.

Please note that Ecology has concurred with specific aspects of closure (Wallace 1993). This correspondence will be cited in the closure plan.

The closure plan will be modified in accordance with WAC 173-303-610(3)(b) to include greater detail when available. Ongoing waste management/generation during and after the distillation operation will be addressed in more detail (e.g., the location/existence of any 90-day storage zones will be discussed).

B. The conditions assumed in the plan adequately reflect the true conditions of the facility.

RL/WHC Response #1: Some assumptions were made in order to constrain the complexity of the closure plan. There is much evidence described in the closure plan showing that closure via waste removal is practical at the HSTF. Therefore, the closure plan is based on this probability and allowances have been made for the alternative landfill closure. The latter would require revision of Chapters 5.0 through 8.0, and the addition of a postclosure permit application; it is proposed that this unlikely occurrence would be addressed as a permit modification as required by WAC 173-303-610(3). Beyond this, the authors are unaware of significant "conditions assumed", and request clarification from Ecology.

No.	Comments/Response	Concurrence
2.	Key elements of the closure plan are inadequately addressed. Please provide additional information regarding the following topics. A. Adequate and complete post-closure plan and care. **RL/WHC Response #1: Clean closure, or closure with contamination levels that are protective of human health and the environment, is proposed. The available site information indicates that this is readily attainable. As such, the HSTF is not subject to the postclosure requirements of landfills, surface impoundments, or waste piles. Interim stabilization may be required if cleanup is delayed until a CERCLA-coordinated remedial action can be implemented, as addressed in Section 7.4 of the closure plan, prior to closure. If evidence of extensive soil contamination is found during the removal of the underground tanks, the need for further investigation and remediation will be evaluated, the closure plan revised, and a postclosure plan produced, as necessary. Also refer to the response to comments 1A and 1B.** B. The determination of the boundary locations. **RL/WHC Response #1: Please note that an approximate boundary is depicted in Figure 2-3 of the closure plan. All equipment and structures addressed in the closure plan will undergo closure. It is stated on page 8-1, lines 18-19, that a site description will be conducted if the planned closure action cannot be attained. Text will be added to briefly discuss a general geographic boundary (i.e., the fenced enclosure and the areas of piping, distillation operation, and storage).** C. When CERCLA cleanup is proposed to comply with RCRA	

No.	Comments/Response	Concurrence

regulations, explain in detail what will be done so that we may evaluate whether the cleanup will in fact meet RCRA closure requirements.

RL/WHC Response #1: Refer to the response to comment numbers 1A, 8, and 17.

D. Detection limit capabilities, as well as action levels.

RL/WHC Response #1: Detection limit capabilities are addressed in the Quality Assurance Project Plan (Appendix 7A) in Table 7A-1. This table will be modified to more completely define and identify the detection limits. Chapter 7.0 of the closure plan will have text incorporated to discuss detection limits and to call out the location of this table. Action levels are defined in Section 6.2 (page 6-2, lines 10-31) of the closure plan.

3. According to Section 4.0, waste characteristics, the waste is mixed waste by definition (containing both hazardous and radioactive components). The plan makes few references to safety protocol or cleanup procedures for the mixed waste. Control of health and safety hazards associated with the radioactive component of the waste are inadequately addressed. It is not acceptable to omit the management of the radioactive constituents from the closure plan.

Revise the text accordingly to incorporate measures that deal with the radioactive components of the mixed waste.

RL/WHC Response #1: Adequate safety measures and materials management, with respect to radiological zones and materials, will be implemented, as required by the *Atomic Energy Act of*

No.	Comments/Response	Concurrence

1954 , as amended. It is the interpretation of the U.S. Department of Energy that the radioactive component of mixed waste is regulated by the *Atomic Energy Act of 1954*. Ecology has the authority to regulate the nonradioactive dangerous waste component of mixed waste. Consequently, the disposition of HSTF mixed waste is stated in the closure plan. The method of handling and the safety procedures associated with radiologic concerns are beyond the scope of the closure plan. Documents that identify such procedures will be available to Ecology prior to closure.

4. The closure plan must describe the procedures and criteria to be used for evaluating the extent of soil contamination and demonstrate that the level of decontamination will satisfy the closure performance standard.

The location for background soil measurements, etc., should be included in the closure plan.

RL/WHC Response #1: The use of a Sitewide-based standard soil background is proposed in the closure plan. This standard, or method, could be that of 'Hanford Site Soil Background' as referenced in the closure plan. This selection of background data does not rely on local background sampling and has been approved in other closure plans [e.g., *105-DR Large Sodium Fire Facility Closure Plan* (Notice of Deficiency comment #23 and #25) and *3718-F Alkali Metal Treatment and Storage Facility* (Notice of Deficiency comment #2)].

No.		Comments/Response	Concurrence
Specific			
5.	iii/34-44	Westinghouse Hanford Company is described here as "co-operator." What entity is the operator as defined in WAC 173-303-040? Name the operator identified in the plan. **RL/WHC Response #1: Lines 7-8 of page iii of the closure plan identify the operator of the facility.**	
		Chapter 1 - Introduction	
6.	1-1/15-19	See comment 3. **RL/WHC Response #1: Refer to the response to comment #3.**	
7.	1-1/29	Define the word "virtually" in the context used. **RL/WHC Response #1: This sentence will be modified as follows: "...leaving the tanks virtually empty of liquid [250 gallons (950 liters) of sludge and 5 to 30 gallons (19 to 115 liters) of liquid solvents and water]."**	
8.	1-1/42-49	See comment 2B. How can soil cleanup be deferred, given the requirements of WAC 173-303-610(2) and 173-303-640(8)(b)? **RL/WHC Response #1: Refer to comment responses #1A and #2A.** **The Tri-Party Agreement (Article XXIV) requires that cleanup actions under each regulatory agency be physically consistent. It is suggested that multiple cleanup actions with differing performance standards for the same waste management unit are**	

No.		Comments/Response	Concurrence

not a desirable option. Because the regulatory agencies have yet to fully integrate remedial action requirements, "deferral" remains as a salient option.

Refer to the response to comment 17 for the coordination rationale.

Chapter 2 - Facility Description

9. 2-2/23-26

A. Poor reproductive quality of the 276-S Piping details (Appendix 2B-4). Unable to read dates and other pertinent information.

RL/WHC Response #1: Several other potentially helpful schematics of the tank system are being maintained as records. All exist in the form of aperture card film and are poorly reproducible. A records search has yielded no original drawings other than the construction plans given as Appendix 2B-5. In Appendix 2B, Figures 2B-1 through 2B-3 were included in the closure plan as representative diagrams at an appropriate scale to illustrate all ancillary equipment and piping associated with the tanks prior to, during, and after the installation of the distillation system. If further information is needed, the aperture cards and viewers are available to Ecology upon request and a cognizant engineer/scientist will be accessible for assistance.

B. Incomplete drawing number 952 (Appendix 2B-5). Drawing does not show entire schematic length of tank.

RL/WHC Response #1: Discussion has revealed that one of Ecology's copies of the closure plan had a mis-copied schematic. A new copy of the schematic was presented to

No.		Comments/Response	Concurrence
		Ecology at the April 15, 1992 HSTF Unit Managers Meeting.	
10.	2-2/36	See comment 9B. **RL/WHC Response #1: Refer the response to comment #9B.**	
11.	3-1/27-29	Further define the text which states in part, "it is possible that small amounts of hexone from the hot semi-works (pilot scale plant operating in the 1940's and 1950's for developing and refining plutonium extraction methods) also were placed in the tanks." Or reference applicable table. **RL/WHC Response #1: This statement will be deleted from the closure plan. It is based on unverifiable verbal communication. A search of Hot Semi-Works shutdown records and HSTF records shows no such transfer of hexone.**	
12.	3-1/51	Further define the text which states, "some water was added to float the remaining Hexone." Provide a better quantitative estimate of water addition. **RL/WHC Response #2: The sentence on line 51 will be modified as follows: "...distillation system, about 200 gallons (760 liters) of water was added..."** Chapter 4 - Waste Characteristics No comments. Chapter 5 - Groundwater Monitoring	
13.	5-1	Explain why HSTF is not subject to closure/post-closure requirements per WAC 173-303-610(5) and 173-303-640(8).	

No.		Comments/Response	Concurrence
		If clean closure is not achieved a post-closure plan must be submitted. Since it cannot be certain that the Hexone unit can achieve clean closure please provide a contingent post-closure plan. The post-closure plan must adequately address ground water monitoring. **RL/WHC Response #1: Clean closure (to health-based thresholds) of the HSTF is planned. This may require coordination with the CERCLA remedial action for the operable unit containing the HSTF. There is no evidence indicating that clean closure cannot be attained. The only circumstances that may prohibit clean closure are (1) integrated site planning that designates the area for landfill waste management, or (2) extensive soil contamination. The former is unlikely, and its conceptualization is well beyond the scope of this closure plan. Constant liquid levels in the tank until removal for distillation make a strong case against the latter. Groundwater contamination is much less probable, given the leakage volume necessary to infiltrate to a depth of over 200 feet. Records demonstrate that disposal was not an operating practice during the operating life of the tanks and that the tanks have not leaked significantly, or at all, during their lifetime.**	
14.	5-1/25-27	How was it determined that organic waste was not detected? How much surface area is representative of one end of a single tank? Were samples obtained? If so, describe procedure constituents tested and methods to support the text. **RL/WHC Response #1: The following will be added to line 27: "Hand excavation of the west ends of the tanks in 1976 revealed only dry soil and no detectable odor (an MSDS from Occupational**	

No.		Comments/Response	Concurrence
		Health Services Inc. reports an odor threshold for hexone of 0.3 to 0.5 pounds per minute). Although less than 10 percent of the total surface area of each tank was exposed, these observations reinforced the assessment of a sound tank system. No samples were taken."	
15.	5-1/33-38	Provide data input into the computer automated surveillance system (CASS), and statistical justification from other similar tanks to support the conclusion that "no leakage is believed to have taken place from these tanks." **RL/WHC Response #1: This comment was discussed during the March 17, 1992 HSTF Unit Managers Meeting. Ecology agreed that a table that summarizes data at periodic time intervals (e.g., yearly) would resolve this comment. A chart will be incorporated into the Revision 1 of the closure plan.** **The sentence beginning on line 33 will be modified as follows: "...data are input to the Computer Automated..."**	
16.	5-1/42-43	Describe how the surrounding soil bed will be examined. Are video and photographic documentation planned during this crucial process? What other means of examination are planned? Please provide complete process, procedure, and equipment to be used during this examination. How will soil sampling correspond to this process? **RL/WHC Response #1: In Chapter 7.0 of the closure plan, text will be added to specify that the evaluation of the soil bed will be based on visual examination and analytical field screening, and that photographic documentation will be implemented. If contamination is not indicated by these means, the sampling identified in Sections 7.2.3.1 and 7.2.3.2 will**	

No.		Comments/Response	Concurrence
		provide verification. If contamination is evident based on field methods, the same sampling program will be performed in an effort to obtain the contaminated soil composition and to facilitate remediation.	
17.	5-1/43-47	It is not appropriate to discuss how contaminants which may have come from HSTF will be characterized and remediated under CERCLA operable unit 200-PO-2. Discuss and demonstrate that the requirements under WAC 173-303-610 and 173-303-640 are being appropriately applied for RCRA closure performance standards. RL/WHC Response #1: It is the position of RL/WHC that cleanup actions must be performed in a manner that is efficient and consistent on a Sitewide basis. Cleanup of potentially extensive soil contamination within a larger area zoned for later all-encompassing characterization and remediation presents the possibility of (1) inconsistent remedial actions due to lack of coordination, (2) recontamination of the inner area prior to the CERCLA effort, (3) juxtaposition of differing risk levels in areas of identical usage and character, and (4) the cost of two projects when one would suffice. Please refer to the responses to comments #1A and #8. U.S. Department of Energy, Richland Operations Office has attempted to establish a uniform health-based cleanup standard [Hanford Site Baseline Risk Assessment Methodology (HSBRAM); referenced in the closure plan] for a range of land-use eventualities. Preparation of this standard is sanctioned by the Tri-Party Agreement process (Milestone M-29-03). It is intended to provide a risk assessment methodology that is consistent with current regulations and guidance. The method	

No.		Comments/Response	Concurrence
		was developed specifically to evaluate risk for CERCLA remedial investigations and RCRA facility investigations. The health-based method of HSBRAM is similar to, and consistent with, the *Model Toxics Control Act* (WAC 173-340), but unlike *Model Toxics Control Act*, prescribes the uniform application of health-based risk assessment. Hanford Site Baseline Risk Assessment Methodology has been accepted by the EPA and Ecology generally at the Hanford Site, and is consistent with the consensus of Tri-Party Agreement project manager meetings and Ecology's meetings with the business community that health-based standards will replace background in WAC 173-303. Hanford Site Baseline Risk Assessment Methodology is proposed in the HSTF closure plan.	
		Chapter 6 - Closure Strategy and Performance Standards	
18.	6-1/10-17	The removal or decontamination of waste residues, equipment(s), solid, or other materials contaminated with dangerous waste or dangerous waste residue must not exceed background environmental levels for characteristic or listed waste or designation limits for state only waste (WAC 173-303-610(2)(b)). RL/WHC Response #1: Refer to the response to comments #1A and #17.	
19.	6-1/39	See comment 16. RL/WHC Response #1: This sentence will be replaced with "Before tank decontamination, field screening and a visual examination of tank integrity and surrounding soils will be performed." The modifications discussed in the response to comment #16 will elaborate upon examination methods.	

No.		Comments/Response	Concurrence
20.	6-1/43	Further define the decision making process as to why additional soil samples would not be taken to evaluate soil contamination. **The criteria for determining the need to sample any soil during the tank removal operation is discussed in pae 6-1, lines 37-42 of the plan. The text modification discussed in the response to comment #16 gives further basis for the decision. The reason for not expanding sampling efforts at this time is clarified on page 6-2, lines 1-5, of the closure plan. Any extensive or non-HSTF derived soil contamination will be integrated with the operable unit cleanup, including further characterization of extent, for consistency, and for cost minimization. Comments #1A, #8, and #17 discuss coordination with the operable unit cleanup.** **The sentence on lines 1 and 2, page 6-2, will be replaced with the following: "If the extent of any contamination is apparent based on the investigation described in Chapter 7.0, Section 7.2, and if it is evident that it is practicable to remove or treat this soil prior to the consideration of any potential surrounding contamination under CERCLA, remediation will occur expeditiously under RCRA."**	
21.	6-1/49	Ambiguous terms such as "action levels" are not appropriately defined for the function of this document. Also, see comment 18. **RL/WHC Response #1: The general term "action levels" is used here because of the proposed triad of cleanup standards: background, limit of quantitation, and health-based levels. This term and approach is used in all closure plans currently, and has passed Ecology reviews in older plans (e.g., the *303-K***	

No.		Comments/Response	Concurrence
		Radioactive Mixed Waste Storage Facility Closure Plan and the *304 Concretion Facility Closure Plan*). **Refer to the responses to comments #1A and #17.**	
22.	6-2/1-5	Does this strategy meet closure performance standards? Provide technical and legal justification for this strategy. Elaborate on why post-closure will not be necessary, and explain standards used in the determination. **RL/WHC Response #1: Refer to the responses to comments #1A, #2A, #8, and #17.**	
23.	6-2/10-19	See comment 21. **RL/WHC Response #1: Refer to the response to comment #21.**	
24.	6-2/12-13	Further define "limit of quantitation" as it is being used in the surrounding text. **"Limit of quantitation" as used in this closure plan is defined in lines 14-17 of the same paragraph. This definition will be replaced with: "(generally ten times the standard deviation of replicate analyses of a method blank or low concentration sample)."**	
25.	6-2/18-19	Why are CERCLA action levels being applied rather than background environmental levels for listed or characteristic wastes or designation limits for state only waste (WAC 173-303-610(2)(b)). **RL/WHC Response #1: Refer to the responses to comments #1A, #2A, #8, and #17.**	

No.		Comments/Response	Concurrence
26.	6-2/38-42	Radioactive detection may be used to supplement chemical analytical methods, however, radioactive detection methods will not replace chemical analytical methods. **RL/WHC Response #1: Replacing the specified chemical sampling and analysis identified in Chapter 7.0 of the plan is not the intent of this statement. Text will be added to clarify that the minimum sampling-analysis described in Chapter 7.0 will be implemented. The text that reads "or replace" will be deleted from line 41.**	
27.	6-3/14-29	Either simply cite WAC 173-303-610(2)(b) and WAC 173-303-640(8) or quote the complete section of the regulation. **RL/WHC Response #1: The citation will be modified as follows: "WAC 173-303-610(2)(a)." Text will be added to identify the other performance standards in WAC 173-303.**	
28.	6-4/9-11	Strike the text which states, "and implemented by the Hanford Site Baseline Risk Assessment Methodology (DOE-RL 1992 C)." **RL/WHC Response #1: Refer to the responses to comments #8 and #17. It is recommended that HSBRAM be retained as a Sitewide remediation performance standard.** **The text "WAC 173-303 and implemented by" will be deleted.**	
29.	6-4/42-44	See Comments 18 and 22. **RL/WHC Response #1: Refer to the responses to comments #18 and #22.**	

No.		Comments/Response	Concurrence
		Chapter 7 - Closure Activities	
30.	7-1/6-7	Closure activities may need revision if additional unit conditions become apparent or changes to the closure strategy are made. **RL/WHC Response #1: Agreed. This comment does not require text change, as was discussed at the May 12, 1992 HSTF Unit Managers Meeting.**	
31.	7-1/7-9	These details i.e., work plan, dangerous waste operating plan, and radioactive work permit, <u>are not</u> considered beyond the scope of the closure plan. **RL/WHC Response #1: Apparently this issue is unresolved. RL/WHC has maintained that these documents will be generated prior to the remedial action, but will not be a condition of closure plan approval unless so stated in the *Hanford Facility-Wide Permit*. Ecology seems to have varied in their acceptance of this strategy. An example of approval of this policy would be the *2727-S Non-Radioactive Dangerous Waste Storage Facility Closure Plan* and the associated closure activities, and the *3718-F Alkali Metals Storage Facility Closure Plan*.**	
32.	7-1/11-12	These standard documents specific to HSTF are requested. **RL/WHC Response #1: These documents will be furnished to Ecology when they are completed.**	
33.	7-1/41	Stride (sic) the word "Tentatively". **RL/WHC Response #1: The proposed strategy is possible deferral of soil remediation to a joint CERCLA/RCRA cleanup effort.**	

No.		Comments/Response	Concurrence
		This later phase of remediation would include further evaluation of the extent of contamination. The closure plan will be revised if deferral is indicated. The term "tentatively" will be replaced with "preliminarily." The title of this subsection will be changed to "Purpose of Investigation", in order to embrace field screening more effectively. Comments #1A, #2A, #8, and #17 address deferral.	
34.	7-1/47	Further define when EPA methods (EPA 1990) will be employed and why they may not. **Because all anticipated analysis within the scope of this closure plan (with the exception of field screening activities) have associated EPA methods, the text "where possible" and the specific EPA reference will be deleted.**	
35.	1-1/11	This unit is potentially contaminated with radionuclides. Section 6.3 of the TPA states "TSD units containing mixed waste will normally be closed with consideration of all hazardous substances, which includes radioactive constituents." This closure plan does not fulfill the intent of the TPA. Revise text accordingly. **RL/WHC Response #1: The HSTF will be closed with consideration of all hazardous substances, including radioactive constituents. Strategies and procedures for dealing with radioactive constituents and contaminants that were not derived from the HSTF will be addressed under past practice authority as allowed in the Tri-Party Agreement, Section 6.3, or during the RCRA closure of the HSTF. In either circumstance, information relating specifically to the management of radioactive materials will not be included in the closure plan**	

No.		Comments/Response	Concurrence
		but will be available to Ecology. Please refer to the discussion of the #1A, #2A, and #3 comments and responses.	
36.	2-2/16-19	Describe how rinsate generated during decontamination efforts was managed (i.e., as a hazardous waste). **RL/WHC Response #1: It is stated in the closure plan that all rinsate was transported to the Diversified Scientific Services, Incorporated incinerator with the distillate shipments (page 7-8, lines 14-16; page 7-9, lines 1-2) and that any and all waste generated during decontamination will be treated, stored, and/or disposed of in accordance with all applicable regulations (page 7-10, lines 48-50). The plan will be revised (Sections 7.3.1 and 7.3.3) to clarify that all rinsate was flushed directly into the tank trailer being loaded for shipment to the incinerator, without intermediate storage.**	
37.	2-3/14-20	Specify if tank monitoring and inspections were conducted in compliance with the requirements of WAC 173-303-640, Tank Systems. **RL/WHC Response #1: Tank monitoring and inspections are described in Chapter 5.0. This paragraph will include a reference to Chapter 5.0. The text of Chapter 5.0 will be modified to specify the frequency of liquid level inspection and inspection of aboveground equipment and soil, prior to the emptying of the underground tanks in December of 1990.** **Note: The underground tank system (described in Chapter 2.0) does not have the overfill/spill control equipment, external monitoring and leak detection equipment, or cathodic protection addressed in 40 CFR 265.195, which is incorporated by reference into WAC 173-303-400.**	

No.		Comments/Response	Concurrence
38.	2-3/29	Specify the length of time distillate was stored in the railcars. **RL/WHC Response #1: Refer to page 3-1, line 41; and page 3-2, lines 27 and 28. The sentence on lines 21 and 22 of page 3-2 will be modified as follows: "...the four distillate storage tank cars to await incineration (transport to the incinerator took place in eight separate shipments between 11 and 18 months after completion of the distillation operation)."**	
39.	2-3/23	Specify if any releases to secondary containment occurred; and if so, how were they managed. **RL/WHC Response #1: The following statement will be added to Chapter 2.0, page 2-4, line 4: "No releases occurred to secondary containment."**	
40.	2-3/32-44	Specify if the heat-transfer oil contained Polychlorinated Biphenols (PCBs) and if any release of oil occurred. **RL/WHC Response #1: The following sentence will be added to line 32: "A nonhazardous white mineral oil (Multitherm* PG-2) free of PCBs was used as a heat-transfer medium."** **The following sentence will be added to line 44: "Minor seal weepage of the heat transfer oil was contained inside the oil heating unit."**	
41.	2-4/15-32	Revise security information due to the recent security downgrades onsite. **RL/WHC Response #1: The text will be revised as requested. Significant changes are discussed below.**	

No.		Comments/Response	Concurrence
		The addition of the following: Signs are, or will be, posted at the 200 West Area fenced enclosure that read 'NO TRESPASSING. SECURITY BADGES REQUIRED BEYOND THIS POINT. PUBLIC ACCESS PROHIBITED.' In addition, warning signs stating 'DANGER--UNAUTHORIZED PERSONNEL KEEP OUT' (or equivalent legend) are, or will be, posted at the HSTF. These signs are, or will be, written in English, legible from a distance of 25 feet (7.6 meters), and visible from all angles of approach. **Most of the first paragraph will be deleted.**	
42.	3-1/10	The loading platform and hose connection discussed here must be included in the boundary of the unit. **RL/WHC Response: The area formerly occupied by the loading platform and hose connection is included in the boundary of the unit (refer to comment #2B response). The hose connections were removed to a point just above ground level in the late 1970's and the platform was removed in 1988.**	
43.	3-1/37	The closure presented in this plan does not account for the Sodium Hydroxide or its regulated reaction products. State concentration, was added to the tank (s). **RL/WHC Response #1: The following sentences, beginning on line 33, will be deleted: "In the mid-1970's, approximately 500 gallons (1,890 liters) of water were added to tank 276-S-142 to adjust the liquid level ... after the weight factor dip tube corroded through (this tube is thin-walled relative to the tank walls). Sodium hydroxide was then added to decrease the corrosiveness of the water."**	

No.		Comments/Response	Concurrence
		A further search of records has shown that while the addition of water and sodium hydroxide was planned and documented by a procedure, it was never carried out. The statement was therefore in error and will be deleted. Mention of sodium phosphate in Chapter 4.0 will be deleted as well.	
44.	3-1/41-44	Revise text to elaborate on the chemical composition of the sludge remaining in the tanks. **RL/WHC Response #1: Available information regarding the current contents of the tanks will be shown in a table. Text will be added to the closure plan to introduce this table.**	
45.	3-1/48	Explain how the dismantled piping and equipment was managed with respect to the Dangerous Waste Regulations. **RL/WHC Response #1: The sentences of lines 46-48 will be replaced with the following: "The original pump system remains intact except for the railcar loading platform and hose system, and the overhead transfer pipe to the 276-S Building. The structural steel unloading ramp was disposed of as metal scrap in the late 1980's. The dry overhead transfer pipe and the dry hose system on the unloading ramp were disposed of as low-level radioactive waste in the late 1970's (Appendices 2A and 2B)."** **The sentence on line 50 will be changed as follows: "... containerized as mixed waste in early 1992 and shipped to the mixed waste storage section of Hanford's Central Waste Complex."**	
46.	3-2/31-34	See comment 45.	

No.		Comments/Response	Concurrence
		RL/WHC Response #1: Chapters 2.0, 3.0, 7.0, and Appendix 2A discuss the disposition of such equipment, piping, and structures. **Chapter 3.0 will be modified to identify the offsite incinerator as a mixed waste incinerator.** **The text of Section 7.3 will be modified to include the following information: decontamination of the tank cars and other distillation equipment was approved by Ecology (Wallace 1993); secondary containment piping never contacted hazardous waste and was disposed of as low-level radioactive waste, the steel track pans (secondary containment) are scheduled to be disposed of as clean scrap metal.**	
47.	4-1	Failure to fully designate waste is the major deficiency of this chapter. Revise text to incorporate designations for all wastes associated with the unit. **RL/WHC Response #1: The intent of Chapter 4.0 is to provide the reader with a general knowledge of the waste managed at the facility, not to enable waste designation. Waste designation for inventory managed at the facility is listed and described in the Part A Permit Application included in the closure plan. Waste designation for residues is incomplete at this time, and will be conducted prior to completion of closure as stated in the closure plan (where necessary) (e.g., in Section 7.3.4.3). Please refer to other closure plans (e.g., the *303-K Radioactive Mixed Waste Storage Facility Closure Plan*, or the *304 Concretion Facility Closure Plan*) for a similar strategy that has been reviewed by Ecology.**	
48.	4-1/15-16	See comment 35.	

No.		Comments/Response	Concurrence
		RL/WHC Response #1: Refer to the response to comment #35.	
49.	4-1/20-25	The discussion of the properties of normal paraffin hydrocarbon and tributyl phosphate is enlightening but far from complete. The information provided does not allow for designation and present all pertinent characteristics used to do so, preferably in table format. **RL/WHC Response #1: Refer to the response to comment #47.**	
50.	4-1/27-35	The disposition of the substances discussed in this paragraph is not clear. Clarify if these substances are components of the distillate, which has been incinerated, or if they are still present at the unit. If these substances were incinerated provided evidence that the treatment was appropriate and complete. The Sodium Hydroxide has not been appropriately addressed throughout this plan. See #43. **RL/WHC Response #1: The text will be modified to specify the fate of each constituent (i.e., whether it remained in the still vessel or exited as distillate). The incineration is discussed in Section 3.2. Copies of the certificate of destruction are available upon request.** **Sodium hydroxide: Refer to the response to comment number 43.**	
51.	4-1/37-43	This paragraph contradicts itself. The first sentence states that esters, acetone, and fluoride were detected in analysis of the distillate. Then the last few sentences qualify discussions of the acetone and fluoride with the phrase "if present". Are acetone, fluoride, and esters present in the	

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distillate but not in the waste remaining in the tanks? State what compounds are present int he tanks and in the distillate.

Also chapter 6.0, Closure Strategy and Performance Standards, states that Chromium, Cadmium, Barium, and Lead were detected in trace amounts from analysis of the still vessel contents. Why are these not discussed as waste characteristics? Expand the waste characterization discussion to address all wastes associated with the unit and analysis conducted to determine their presence. A table coordinated with a through discussion would be helpful.

RL/WHC Response #1: It is uncertain whether the analysis for these constituents is accurately representative of the distillate composition. Process information does not corroborate the presence of fluoride or acetone. A spurious result for fluoride is suggested by its apparent absence in seven of eight similar samples. A plausible explanation for acetone is given on page 4-1, lines 41-42. The still vessels and remaining tank contents, and any associated contaminated material to be disposed of, will be designated based on WAC 173-303 using conservative assumptions as appropriate. Please refer to the responses to comments #47 and #50. Further, it is stated in the closure plan, Section 7.4.3, that the remaining underground tank contents will be designated prior to disposal. This will entail sampling and analysis. Section 7.3.3 will be modified to describe the vessel tar and associated analytical information.

The metals were not discussed as waste characteristics because the concentrations of these constituents in other media, such as the underground tank sludge/tar, are not known at this time. The closure plan is envisioned as a "plan" for closure, not the

No.		Comments/Response	Concurrence
		vehicle of documentation for completion of closure actions. Please refer to the response to comment #47. Please identify the requirement that indicates that designations for waste residues or other waste produced during closure, or unsampled waste byproducts, be included in the closure plan.	
52.	4-2/1-52	The discussion of the tank contents over the period of use raises many questions. It appears that tank 276-S-141 never held radioactive material, unless contaminated by the configuration of the venting system. Therefore it is absolutely inappropriate to consider using rad surveys for the detection of potential contamination as suggested in other areas of the plan. Line 17 states that 0.25 curies alpha emitters and fission products remain. Specify curies per what, (per tank, per gallon)? Provide a complete description of activity, distribution and source of radioactive contamination. This requirement is necessary in order to allow the Closure Plan to function as intended. The plan must provide adequate information and instruction to allow closure to be conducted in a safe, appropriate, and acceptable manner. **RI/WHC Response #1: Tank 276-S-141 held tritiated hexone that was purified in the Reduction Oxidation Plant distillation column. Contamination by venting is impossible, because each tank vented independently to the outside until the distillation system and associated vent piping were installed. The closure plan states that radioactive materials were added to, and present in, both tanks (Chapter 3.0, page 3-1, lines 25-27 and Table 4-1). The text of line 17 is correct and specific. The volume of organic mixture within the tank contains a 0.25 curie quantity of alpha emitting and fission product radionuclides. Chapter 4.0 will be revised throughout to clarify the above and to distinguish between process and analytical information. The**	

No.		Comments/Response	Concurrence
		chapter will be re-organized, and the tables will be better explained, deleted, and/or modified. Because all tank contents are radioactive, radiation surveys are the most sensitive means of detecting potential contamination. Refer to the response to comment #3 regarding discussion of radioactive materials.	
53.	4-2/18-21	Throughout the life of the tanks water was added several times for various reasons. The volume and function of these additions, especially to tank 276-S-142, have been difficult to follow as presented in the plan. For example, it is not clear why 1,300 gallons were added to 276-S-142 in 1967. The volume of Sodium Hydroxide has not been adequately accounted for. Specify the amount, purpose of and final disposition of each addition of water. RL/WHC Response #1: Line 19 will be changed to: "... of flush water in 1967." No sodium hydroxide was added to the system. Please see the response to comment #43. The 1,300 gallons of water were added to Tank 276-S-142 with the transfer of americium campaign waste (Section 4.2) for pipe flush purposes. The only other water addition was in 1988 for piping hydrotest work. The water in both tanks was pumped with the other tank contents to the distillation system, joining the other distillate components. The closure plan will be clarified on these points. Refer to the response to comment #15 as well.	

No.		Comments/Response	Concurrence
54.	4-2/24-26	It is stated that the tanks were sampled twice; once in 1976 and once in 1992. Then it is said that the 1988 work obtained representative samples, and measured radioisotopic concentrations. The association, or independence, of the 1988 sampling with the other events is not clear. Describe all analysis performed and their findings, including radiochemistry. **RL/WHC Response #1: The tanks were sampled twice: January of 1976 and September of 1987. The 1976 samples are reported in Strachan, 1976. The 1987 samples were analyzed in 1987 and 1988 and are reported in Rasmussen, 1992 (complete references are given in Chapter 9.0 of the closure plan; copies are available upon request). The text of Chapter 4.0 will be modified to clarify this and to distinguish between process information and analytical information.**	
55.	4-2/30-46	The analytical results and historical knowledge presented here is incomplete and is not representative of the waste. A major deficiency is that process knowledge is not distinguishable from analytical results. The phrase "tarry sludge" is an inappropriate description. The chemical composition and physical properties of the sludge must be addressed. **RL/WHC Response #1: Refer to the responses to comments #51 and #54. The term "tarry sludge" will be expanded.**	
56.	4-3/6	See previous comment. **RL/WHC Response #1: Refer to the response to comment #55.**	
57.	T4-1	This table misrepresents the composition of the waste. Trace metals, esters, acetone, fluoride, other degradation products,	

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No.		Comments/Response	Concurrence
		and sodium hydroxide have been identified as components of the waste from various analysis. Therefore, incorporate them into the table(s), specifying their current disposition. **RL/WHC Response #1: Please refer to the responses to comments #47, #50, and #51. The caption of Table 4-1 will be modified to clarify that this table gives the bulk waste inventory managed at the HSTF prior to distillation.**	
58.	T4-2	This table is inadequate. Properties utilized to designate the waste and appropriate waste designations codes should be incorporated into the table. If possible, specify whether components are degradation products, or original components, and if whether process knowledge or analytical results were used to designate. **RL/WHC Response #1: The purpose of this table is to familiarize the reader with physical properties of the waste. Regulatory waste designation is not the purpose of the table (refer to the Part A Permit Application for designation of waste managed at the facility). The revision of Chapter 4.0 (comment #52) will clearly differentiate between original and degradation products, and between process and analytical information. Please refer to the responses to comments #47, #51, and #54.**	

No.		Comments/Response	Concurrence
		RL/WHC Response #1: This sentence will be replaced with the following: "It is expected that the groundwater monitoring requirements of WAC 173-303-645, will not be applicable to the HSTF because clean closure is planned."	
61.	5-1/12-15	Specify why integrity testing was initiated. Was it due to the corrosion of the weight factor dip tube? Also, state if the integrity testing was conducted in compliance with the requirements of WAC 173-303-640, Tank Systems. **RL/WHC Response #1: The sentence on line 13 will be modified as follows: "Tank integrity testing was performed in 1976 after the thin-walled weight factor dip tube in tank 276-S-142 rusted through and gave rise to concern about corrosion in the tanks. The west dished ends of both tanks were excavated, and the metal thickness was measured, yielding the following results...** **Comment: WAC 173-303-640 did not exist in 1976 and was not available to testing personnel.**	
62.	5-1/32-37	It has been demonstrated that the tanks contained corrosive material. Due to the dissimilarity of properties of the tank contents to those of petroleum, it is inappropriate to assume that the tanks did not leak because petroleum tanks of similar age and construction did not leak. Revise text accordingly and specify if the monitoring was continuous or periodic. **RL/WHC Response #1: The following changes will be made:** **Line 32 will be "Periodic (weekly, three times per week, and eventually daily) surveillance of liquid levels..."**	

No.		Comments/Response	Concurrence
		Line 36 will be "...(petroleum tanks) containing organic solutions with a water phase at the Hanford Site..." Explanation: Petroleum tanks collect a water phase at the bottom during service. This water phase, rather than the organic phase, is normally responsible for corrosion in petroleum tanks. A comparable situation exists in the hexone tanks, although in Tank 276-S-141, water corrosion is also evident in the organic phase because hexone (when not blended with kerosene as in Tank 276-S-142) will hold 1 to 2 percent water in solution.	
63.	5-1/40	See previous comment. RL/WHC Response #1: No modification is deemed necessary. Refer to comment #62 response. The probability of HSTF groundwater contamination is considered to be extremely remote, but will be evaluated as described in the closure plan. No remedial action decision is contingent upon the evidence and deduction of this chapter. Rather, it is simply the basis for not planning groundwater monitoring or remediation at this time. The sentence of lines 40-41 will be reworded as follows: "Assuming that the tanks did not leak, groundwater contamination in the immediate..."	
64.	6-1/14	See comments regarding figures 6-1 and 6-2 which are referred to here. RL/WHC Response #1: The figures will be updated to be consistent with text changes as resolved in this comment/response cycle.	

No.		Comments/Response	Concurrence
65.	7-3/40	Provide a definition of how close a "close grouping of pipes" will be before they will be treated as one. **RL/WHC Response #1: This section is a general description of sample point selection criteria. In Section 7.2.3.2, under bullet #3, piping groups are discussed in greater detail. Text will be added to direct the reader to this section for discussion of pipe groupings.**	
66.	7-3/51	Provide criteria for the judgmental location of the connect/disconnect point for sampling. **RL/WHC Response #1: The following sentence will be added to page 7-4, line 2: "...have occurred. This location will be at the intersection of the center line of the abandoned railroad track (rails and ties have been removed) with the original reach of the unloading boom on the basis that any leakage would have run down the cylindrical wall of the tank car to its center line."**	
67.	7-4/12-14	It is recommended that at least six samples are taken rather then four. **RL/WHC Response #1: Accepted; the text will be modified accordingly. Text will be added to clarify that, should visual or field screening determine that six samples will not accurately characterize potential contamination, additional samples can, and will, be collected as deemed necessary by the field team leader.**	
68.	7-4/21	The phrase "selected randomly is not correct for such a limited sampling plan. A plan should be discussed; history, field instruments, field observations, etc.	

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		RL/WHC Response #1: The phrase "selected randomly at the direction of the field team leader" will be deleted. The text will state that the specific location of these samples will be where field instruments (and visual inspection and process knowledge) indicate contamination is most likely to be present.	
69.	7-4/28-34	Areas which contain valves or connections must be integrated into the pipe sampling plan. **RL/WHC Response #1: The text will be modified to include valves and other connections.**	
70.	7-5/16, 21, 27, 39, 40	All methods need to be verified. It appears that the wrong methods are listed: • Methods for Hexone should be SW 846 method 8260 • Method for NPH should be SW 846 method 8015, GC-fixed which is more specific • Method for TBP should be SW 846, method 8146, GCFTP or NPDES 1657 • Butanol should be SW 846 method 8270 GGFID, PB-WAX • Butene should be SW 846 method 8260 **RL/WHC Response #1: The methods will be verified. The ultimate selection will be based on agreement (with Ecology and other data users) through the Data Quality Objectives process. It is anticipated that the Data Quality Objectives process and resultant sampling and analysis decisions will be identified in this closure plan. The selected methods will be included in the next revision of the closure plan or reserved until the Data Quality Objectives process is completed.**	
71.	7-5/11	See comment 35.	

No.		Comments/Response	Concurrence
		RL/WHC Response #1: Refer to the response to comment #35.	
72.	7-6/42	Change the word "reviewed" to "validated".	
		RL/WHC Response #1: The following sentence will be added to the end of this paragraph: Appropriate data validation will be determined through the Data Quality Objectives (Citation) process.	
73.	7-6/42	Equipment blanks must be included as part of field quality assurance and quality control.	
		RL/WHC Response #1: Either Appendix 7A or Chapter 7.0 will be modified to implement and describe the use of equipment blanks.	
74.	7-6/52	The words "used as goals" is not acceptable and should be replaced with "...adhered to".	
		RL/WHC Response #1: Accepted, this will be modified as requested.	
75.	7-8/26	More verification is needed in regards to sampling and how it was determined that the car was clean enough to close.	
		RL/WHC Response #1: The following sentence will be added to page 7-8, line 35: "...milliliter). Organic vapor testing of the tank car revealed that the organic vapor concentration was less than the detection limit of 0.1 parts per million and verified the absence of hexone. No other..."	
		It is suggested that this comment is resolved based on Ecology's recent acceptance of the railcar decontamination procedure (Wallace 1993).	

No.		Comments/Response	Concurrence
76.	7-8/50	Results of the sampling and analysis must be provided. **RL/WHC Response #1: A summary table of chemical and radiological analytical results for the distillation vessel tars will be provided.**	
77.	7-9/38	Specify if the liquid residue was sampled and analyzed. If so, provide the results of analysis. **RL/WHC Response #1: A summary table of chemical and radiological analytical results for the liquid residue will be provided. The laboratory report is available upon request.**	
78.	7-10/9	Insert "based on radionuclide and chemical analysis" after "designated". **RL/WHC Response #1: The text will be modified as stated.**	
79.	7-10/49	Wastes generated from the closure will require analysis and designation for radioactive constituents. **RL/WHC Response #1: Refer to the response to question #3. The text will not be modified.**	
80.	7-11/4	See comment 17. **RL/WHC Response #1: Refer to the response to comment #17.**	

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